REVISITING POLITICAL KNOWLEDGE:

THE DIFFERENTIAL EFFECTS OF INFORMATION AND CONSIDERATION ON COLLECTIVE OPINIONS

Jin Woo Kim

Michael X. Delli Carpini

Working Paper

Jin Woo Kim is a Ph.D candidate of the Annenberg School for Communication, University of Pennsylvania, 3620 Walnut Street, Philadelphia, PA 19103 (jkim@asc.upenn.edu).

Michael X. Delli Carpini is Professor of Communication and the Walter H. Annenberg Dean of Annenberg School for Communication, University of Pennsylvania, 3620 Walnut Street, Philadelphia, PA 19103 (mxd@asc.upenn.edu).

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Abstract

In this article we distinguish two dimensions of citizens' political knowledge; *information*—the classic definition—and *consideration* of balanced sets of arguments. Drawing on data from the 2004-2005 Health Dialogue Project, we show that argument awareness is generally slanted in the direction of partisan identities, especially for those possessing high levels of factual information. We then take two methodological approaches to estimate what we call "considered public opinion"—statistical imputation and a deliberation experiment—and find that the public would reach a different collective opinion on healthcare policy if they had taken a more balanced set of arguments into consideration. We also show that the differences in aggregate opinion implied in these estimates move in the opposite direction of what emerges from similar estimates of "fully informed" opinion. We conclude that there is strong reason to treat consideration and information as distinct components of what we mean by knowledgeable citizens.

A central requisite of democracy is that citizens think carefully about the potential advantages *and* disadvantages of a political choice as they form their opinions. In practice, however, the general public appears too uninformed about most aspects of politics to be able to form this kind of "considered" opinion (Converse 1964; Delli Carpini and Keeter 1996; Fishkin 1995).

Concerns over low levels of political knowledge, at least as traditionally conceptualized and measured, tell only half the story, however. Even highly informed citizens might fail as decision makers if the information they possess is biased. Indeed, research indicates that politically attentive citizens are especially drawn to like-minded sources of political information (e.g., Iyengar and Hahn 2009; Mutz 2006; on partisan biases of knowledgeable citizens more generally, see Achen and Bartels 2006; Bartels 2008, 153-161; Taber and Lodge 2006). To the extent this is true, the opinions of an "informed" citizenry (e.g., Althaus 1998; Bartels 1996; Delli Carpini and Keeter 1996; Gilens 2001) may differ from those of a "considered" citizenry—a different but arguably more important normative benchmark. Drawing on the *2004-2005 Health Dialogue Project*, a multi-wave surveys combined with deliberation experiments, we examine the potential tension between these two dimensions of political knowledge; *information*—the classic definition and measurement; and what we call *consideration*—awareness of balanced sets of arguments.

RATIONAL LEARNING

Motivating and informing the starting point of our argument is the notion that in a perfect world citizens use new information to revise their opinions in an unbiased fashion, consistent with Bayesian models of rational learning (see Bartels 2002; Gerber and Green 1999; Taber and

Lodge 2006; Tetlock 2005; but see also Bullock 2009 for common misunderstandings about the implications of Bayesian learning model). As an example, consider the issue of the Affordable Care Act (ACA), also known as "Obamacare." Suppose a Bayesian voter—we call him Ian—will support the legislation to the extent that it is beneficial to him. Let θ be the unobserved net benefit for Ian, and μ_0 be Ian's initial estimate of θ.[1] Following previous studies using the Bayesian framework (e.g., Bullock 2009; Gerber and Green 1999), we assume that this variable is normally distributed: $N\ (\mu_0, \sigma_0^2)$, where the mean is Ian's best guess, and the variance is the uncertainty of the initial belief. Given that he has not received any information about the policy he would acknowledge that μ_0 may be far off the mark. So σ_0^2 is high.[2]

Ian becomes *informed* about the policy as he encounters a new argument that claims that the benefit (or harm) of the policy is x_1. He assumes that x_1 is normally distributed: $N\ (\theta, \sigma_1^2)$, where the variance σ_1^2 captures the (subjective) uncertainty of the new information in argument *i*. For example, if *argument 1* provides overwhelming evidence, the variance σ_1^2 will be very small. Given Ian is an unbiased Bayesian, he will update his belief by calculating a weighted average of his prior belief μ_0 and x_1. His posterior belief can be represented by a normal distribution with mean μ_1 and variance ρ_1, where

[1] More specifically, we define the net benefit (θ) as the weighted average of various benefits reduced to some common denominator (see Achen 1992; Downs 1957, 37; Gerber and Green 1998). We define these benefits broadly; they may include values, self-interests, public interests, altruistic motives, or even simple tastes (see Mansbridge 1983, 25-26). The net benefit of a policy will vary across individuals, to the extent that it has differential effects for different people, and/or people use differential evaluative criteria to judge the importance of these effects.
[2] We follow Zaller's (1996, 21) distinction between exposure and reception in that the latter "involves actually 'getting' or taking in' or 'cognizing' the given message." Therefore, when we say Ian received an argument, we mean that he was exposed to the argument *and* he paid attention comprehending its key reasons and conclusion. We use "consider" and "receive" interchangeably.

$$\mu_1 = \mu_0 \left(\frac{\tau_0}{\tau_0 + \tau_1}\right) + x_1 \left(\frac{\tau_1}{\tau_0 + \tau_1}\right) \qquad (1a)$$

$$\rho_1 = \frac{1}{\tau_0 + \tau_1}, \qquad (1b)$$

and where $\tau_0 = 1/\sigma_0^2$ and $\tau_1 = 1/\sigma_1^2$ are the precisions of the prior belief and the argument, which determine the weights on the prior belief and the new message. If Ian was initially unsure about the benefits of ACA (low τ_0), but then encounters an argument with extremely strong evidence (high τ_1), the new message will be heavily weighted, thereby virtually determining the mean of his updated beliefs μ_1. Given $\tau_1 > 0$, the uncertainty of his belief becomes smaller ($\rho_1 < \rho_0$).

Now suppose Ian repeats this process for a stream of arguments $x_1, \dots, x_n$, where *n* is the number of argument he receives, x_i is a draw from a normal distribution $N\ (\theta, \sigma_i^2)$, and σ_i^2 is the (apparent) uncertainty of argument *i*. The posterior belief given *n* number of arguments is distributed $N\ (\mu_n, \rho_n)$, where μ_n and ρ_n are the mean and variance of the posterior distribution, and

$$\mu_n = \rho_n \left(\mu_0 \tau_0 + \sum_{i=1}^{n} x_i \tau_i\right), \text{and} \qquad (2a)$$

$$\rho_n = \frac{1}{\tau_0 + \cdots \tau_n}. \qquad (2b)$$

Again, the model implies that posterior belief is the average of the initial belief and the arguments, weighted by precisions, and that Ian will become even more certain about his belief after considering a range of new information ($\rho_n < \rho_{n-1}$, when σ_n^2 is finite). Now let η be the posterior belief given *all available* information, the *best possible* assessment of the true benefit. The normative benchmark in this study is a decision that is consistent with η.[3]

THE DIFFICULTY OF BEING "FULLY INFORMED"

For many, a key element of good decision making is political information (e.g., Bartels 1996; Converse 1964; Delli Carpini and Keeter 1996). In the running example, the importance of information is well reflected in the prediction that Ian's belief will be refined as *n* in Equations 2a and 2b increases. On the flip side, if uninformed, Ian's belief will be mostly random error, probably quite distant from η. This prediction accounts for two important consequences of widespread political ignorance (i.e., small *n*) that previous studies have identified. First, citizens'

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[3] η will tend toward the true benefit θ, as the quality and quantity of available information goes into infinity. θ is what Mansbridge (1983, 25) means by "'enlightened preferences' among policy choices, 'enlightened' meaning the preferences that people would have if their information were perfect, including the knowledge they would have in retrospect if they had a chance to live out the consequences of each choice before actually making a decision." Clearly, this definition "can never be put into practice" because "[n]o one can have perfect information." η is the best one can possibly do, given the limitation of existing information. Therefore, η, not θ, is our normative benchmark. The correspondence between η and θ depends the quality of public discourse which, practically speaking, is not the responsibility of the average citizen, but instead of political elites and experts. This is clearly an important issue for democratic politics (e.g., Page and Shapiro 1992, Chap. 9), but not our focus here.

political opinions are usually incoherent and unstable, consisting of what Converse (1964; 1970) calls *nonattitudes*—a characteristics that is more common among less informed citizens (Delli Carpini and Keeter, 1996, 231-237). Second, voters hold policy positions that they would not have supported if they knew more about the issues, leading to collective conclusions that diverge from hypothetical "fully informed" public opinions (Althaus 1998; Bartels 1996; Delli Carpini and Keeter 1996, Chap. 6; Gilens 2001; but see Levendusky 2011 and Pierce 2014 for critiques on this literature).

Of course in practice even highly knowledgeable citizens are not expected to be "fully informed" in the strictest sense. As Berelson et al. (1954, 232) put it "[v]oters cannot have contact with the whole world of people and ideals; they must sample them." So even if Ian was extremely well informed, the range of relevant information he brings to bear is likely a small subset *sampled* from the universe of all possible information of relevance. Like survey sampling, representativeness is a critical benchmark here; a biased sample, no matter how large, cannot form a valid estimate of the unknown parameter of interest. But usually "the sampling is biased" (*ibid*, 232), and the most well known cause of such bias is partisanship, which "raises a perceptual screen through which the individual tends to see what is favorable to his orientation" (Campbell et al. 1960, 133). Since Larzarsfeld, Berelson and Gaudet's (1944, 89-90) seminal work, scholars have raised the concern that citizens fail to consider balanced sets competing arguments because they selectively expose themselves and/or attend to information that is consistent with their partisan identity (e.g., Bennett and Iyengar 2008; Iyengar and Hahn 2009; Jamieson and Cappella 2008; Sunstein 2001; Taber and Lodge 2006; see Hart et al. [2009] for a meta-analysis). And recent research indicates that well-informed citizens are less likely to expose themselves to opposing political viewpoints than others (Mutz 2006, 33; Taber and Lodge 2006).

It is easy to see why biased "sampling" of this kind (i.e., partisan selective exposure) presents a serious challenge to making rational political decisions. Suppose Ian is a Democrat who avoids uncongenial arguments, and thus the information Ian receives systematically underrepresents information about the undesirable consequences of the ACA. In this scenario, per Equation 2a, his estimate of θ is likely biased upward. An unbiased but relatively small sample of arguments can be more useful than a large but biased sample. For instance, suppose that there is N number of voters, who have identical interests and evaluative criteria as Ian, trying to determine whether the ACA serves their best interests. Assume they are unbiased Bayesians, although they consider just a few relevant arguments. For each individual, argument consideration results in only a slight improvement (e.g., a few percentage points increase) over a 50-50 chance, because of individual errors stemming from their random initial guess, and sampling variability in argument selection. But so long as these errors are *random*, they will cancel out when aggregated. So the *average* of Ian-like voters' opinions will quickly approach η even when individuals draw on small information—more rapidly so if the initial guess is given smaller weight than new information.

This idea may be reminiscent of Page and Shapiro (1992), who argue that collective public opinions are "rational" despite individual ignorance and uncertainty. A difficulty with this line of argument, however, is substantiating the assumption that individual errors are randomly distributed (see Bartels 1996; Delli Carpini and Keeter 1996). While Page and Shapiro do acknowledge misleading and manipulative information as one of the prominent threats to the validity of the random assumption, their discussion is focused on the biases of available information, and of those who *produce* it, but not of those who *consume* it. Partisan bias on the part of the citizenry, however, also undermines a crucial condition under which aggregation can make up for the fact that individually, citizens can cover only so much information. Going back to the example of *N* voters with the same interests, if their information consumption is biased against their real interests, per Condorcet's Jury Theorem, the probability that their collective decision serves their interests approaches 0 as *N* goes to infinity—a gloomy possibility indeed.

BALANCED CONSIDERATION AS A HALLMARK OF POLITICAL KNOWLEDGE

Our argument is in line with a central claim found in the scholarship on deliberation; that the quality of democratic decisions depends on consideration of diverse viewpoints (e.g., Fishkin, 1995; Gutmann and Thompson 1996; Mutz 2006, 7-10; Sunstein 2001). At the same time it points out an important limitation in the classic conceptualization and measurement of political knowledge (and Equation 2a)—they do not take partisan bias into account.[4] In order to incorporate the possibility of biased reception of information, we categorize the *n* cases of received arguments into two groups: *k* cases of pro arguments ($x > 0$), and $n - k$ cases of con arguments ($x < 0$), where $n \geq k$.[5] We rewrite Equation 2a as

$$\mu_n = \rho_n\left(\mu_0\tau_0 + \sum_{i=1}^{k} x_i\tau_i + \sum_{i=k+1}^{n} x_i\tau_i\right). (3)$$

[4] Delli Carpini and Keeter (1996, 10) define political knowledge as "the range of factual information about politics that is stored in long-term memory."
[5] See Gerber and Green (1999, 195) for a similar formulation.

Assuming the competing information flows in the public discourse are evenly balanced (e.g., Zaller 1992, 187), the set of pro and con arguments Ian considers should be roughly balanced ($k \approx n - k$).[6] This requirement is violated, for example, when Democrats systematically learn more pros than cons ($k > n - k$), while Republicans do the opposite ($k < n - k$). The classic definition does not make this constraint explicit, leaving open the possibility that seemingly knowledgeable citizens in fact know only one side of the story.

[Figure 1 about here]

For conceptual clarity, we draw a distinction between two dimensions of political knowledge. One is *information* about politics and public affairs—the classic definition—leading to what we call "informed opinion." The other is *consideration* of the central arguments in favor and against a political decision—leading to what we call "considered opinion."[7] Figure 1 visually demonstrates two hypothetical relationships between *information* and *consideration*, with and without partisan bias in political learning; coordinates in the first quadrant represent the number

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[6] This doesn't imply everyone will converge to the middle because the weights associated with each piece of information are assumed to vary across individuals.
[7] Zaller (1992, 40) defines "consideration" as the "reason that might induce an individual to decide a political issue one way or other," which is formed when political arguments are *accepted*. Unlike Zaller, however, our definition does not require acceptance of an argument, but only careful contemplation. This conceptual difference leads to different operationalizations of consideration; unlike the survey item used in Zaller's study to measure considerations— "what idea came to mind as answering the question" — we draw on the open-ended questionnaires that explicitly ask the respondents to mention arguments for *and* against their own view, which enables us to capture the range of reasons a respondent could offer (Cappella et al. 2002).

of pro (Y) and con (X) messages one has received. In the left panel of Figure 1 partisans are equally likely to learn evidence that supports the *opposing* party's position as evidence congenial to their own party. The right panel visualizes biased learning in its most extreme formulation where strong partisans ignore unfavorable arguments altogether.

The first goal of this study is to examine how citizens match against these distinct possibilities, using an argument repertoire measure tapping people's awareness of pro and con arguments about a universal healthcare system (see Cappella et al. 2002 for validity and reliability tests of this measurement). This is essentially a discriminant validity test, establishing the (lack of) correspondence between information and consideration, which may call for better conceptualization and measurement of political knowledge.

ESTIMATING CONSIDERED OPINIONS

If reality resembles the left panel of Figure 1, the issue of improving public opinions largely boils down to correcting for simple political ignorance. This is the condition under which one can treat "informed opinion"— the opinion one would hold if he/she was *informed in the traditional sense*—as the normative benchmark. Empirical research on the effects of factual knowledge (or ignorance) on public opinion and vote choice shares this assumption (e.g., Althaus 1998; Bartels 1996; Claassen and Highton 2006; Delli Carpini and Keeter 1996; Gilens 2001). These studies statistically impute a counterfactual "fully informed" public by comparing each respondent's actual preference with an opinion that a "fully informed" individual sharing the same combination of characteristics is predicted to hold. The gap between such hypothetical fully informed preferences and the respondents' observed preferences is taken to be evidence that information, or the lack thereof, matters for public opinion.

On the other hand, if political learning is closer to the right panel, "informed opinion" is likely to belie the benchmark. It is important to note that the methods that statistically impute informed opinion are essentially changing the observed opinions of lesser informed respondents to those held by well-informed individuals with similar demographic and social characteristics. Therefore, the estimates of "informed opinion" should reflect the characteristics of well-informed people, such as their political interest (Delli Carpini and Keeter 1996), their news media use (Price and Zaller 1993), their information processing strategies (Sniderman et al. 1991) and most importantly for our purposes, the extent to which they consider conflicting perspectives (Mutz 2006; Taber and Lodge 2006). To the extent that the citizen learning process is not evenhanded, it will remain uncertain as to how much the statistically simulated "fully informed" preferences reflect the undesirable effects of partisan bias in information reception (see Pierce 2014).

In keeping with the conceptual distinction between the two facets of political knowledge, we distinguish "considered opinion" from "informed opinion," and define a citizen as having the former if he/she has received a *balanced* set of competing arguments offered by the oppositional sides. Using two empirical strategies, we estimate considered opinions to gauge how balanced consideration affects public opinion. In doing so, we impute "informed" opinions as well, following previous research (e,g,, Bartels 1996; Delli Carpini and Keeter 1996), to examine whether they converge to (or diverge from) "considered opinions."

The first strategy we use for observing considered opinions is statistical imputation methods, similar to Bartels (1996) and Delli Carpini and Keeter (1996). But this time, we use *consideration* instead of *information* to simulate what choice people would make if they had considered a *broad and balanced* range of pros and cons. Specifically, we estimate the effects of considering arguments *for* a universal healthcare system, and the effects of considering arguments *against*. And based on the estimated parameters, we simulate a "considered" public opinion by setting the numbers of pro and con arguments underlying people's opinion to be *equally high* for everyone and calculating the average of the imputed opinions.

A key difference between this approach and previous models of "informed" opinions is that it directly addresses the potential effects of imbalanced learning by *fixing* argument awareness to be balanced—a defining property of a considered opinion. That said, as with prior work (Bartels 1996), the imputation methods involves some strong modeling assumptions, and thus the estimates may be susceptible to a variety of specification errors. Perhaps, the most prominent threat is an omitted variable bias (see Levendusky 2011); those who have considered more (pro or con) arguments about the healthcare issue may have idiosyncratic demographic and psychological traits, and these characteristics, not consideration per se, may produce what is observed to be considered opinions.

As a second empirical strategy, we draw on an experiment where individuals are randomly assigned to participate in public deliberation—an intervention that is designed to produce "refined" public opinion that "has been tested by the consideration of competing arguments and information conscientiously offered by others who hold contrasting views" (Fishkin 2009, 14; see also Barabas 2004; Fishkin 1995; Luskin et al. 2002; Price et al. 2006; for a review see Delli Carpini, Cook and Jacobs [2004]). Research based on experimentally induced deliberation implements this conceptual framework (Barabas 2004; Fishkin 1995; Luskin et al. 2002; Price et al. 2006) by creating carefully balanced argument pools, using trained moderators, and encouraging the participants to be open-minded. Although participants still may not take opposing arguments seriously, it is safe to assume that deliberation can surmount at least one likely cause of imbalanced considerations—selective exposure—as diversity of viewpoints is a minimal requirement that distinguishes it from other forms of political communication (Thompson, 2008).

While the statistical methods for imputing *informed* opinions and public deliberation are sometimes seen as addressing the same underlying phenomenon of political ignorance and its consequences (e.g., Althaus 1998, 547-548; see also Gilens 2001; Sturgis 2003), according to our conceptualization, their emphases may be on conceptually different elements of political decision making. Certain procedures in public deliberation are specifically designed to combat such problems as biased selection of information, which may creep into the estimates of "informed" opinion. Norms, such as equal exchange of diverse viewpoints and careful consideration of competing arguments are theorized to be the defining principles of successful deliberation (Benhabib 1996; Gastil 2008; Gutmanm and Thompson 1996; Habermas 1989). To the degree that the difference between the two research paradigms is substantial, "informed opinions" will *not* correspond to "deliberative opinion."

At the same time, however, the role of argument consideration in actual deliberative forums may be debatable (Mutz 2008; Sanders 1997; Price et al. 2006; Wojcieszak 2011). Although deliberation by definition solves the selective exposure problem, it does not necessarily guarantee balanced *reception* (see footnote 2); people may *attend* selectively to congenial information. Or they may respond predominantly to superfluous information (e.g., partisan cues) without really processing the content of the messages (Petty and Cacioppo 1986; Zaller 1992). The difficulty comes from the fact that there is no acceptable grounds for declaring *a priori* what "considered opinions" would look like (Price and Neijens 1997), which makes the prediction of opinion changes impossible in most cases. That said, there is evidence that formal deliberation and exposure to disagreement in other contexts enhances the understanding of opposing arguments (Cappella et al. 2002; Mutz 2006, 73; Price et al. 2006) and that opinion shifts during deliberation are driven by consideration of well-justified arguments (Westwood n.d.).

One way to solve this dilemma may be to compare the results of the two approaches (deliberation and statistical imputation), which bring *different* (normative and methodological) assumptions to get at the *same* thing—collective opinions of a hypothetically more deliberative citizenry. We should find that they generate similar results so long as both approaches successfully estimate considered public opinions. And to that degree, each may provide complementary evidence for the other. The imputation strategy can generate an expectation about how evenhanded argument consideration during deliberation affects opinion changes *ex ante*, without making an assumption about which collective opinion is "better" for the public. The experimental approach allows us to observe actual opinion changes that arise when people are exposed to diverse viewpoints, without modeling assumptions. Drawing on different methods can be seen as a kind of a convergent validity test: If inconsistent, at least one of them has to rely on wrong assumptions. If consistent, one may have increased (though by no means certain) confidence in the results.

DATA AND METHODS

[Table 1 about here]

Data for our analyses comes from the 2004-2005 *Healthcare Dialogue (HD) Project*, a multi-wave study that combined Internet surveys with online deliberation experiments. Participants in the HD Project were drawn from a representative sample of adult American citizens (aged 18 or older), maintained by Knowledge Networks (now GfK).[8] Because of the software used for the online discussions, those without access to a personal computer were excluded from the sample. Nevertheless, the characteristics of the HD sample reasonably resembles the 2004 American National Election Study sample and the 2004 Current Population Survey benchmark on key demographics and partisanship (see Appendix A). At the screening survey, 3,429 respondents were invited to take part in the study, and 2,193 completed the baseline survey. The final response rate for the baseline survey was 33.5% (AAPOR RR3). Table 1 summarizes the timeline of the major events of the Healthcare Dialogue Study with respect to the analyses we conducted.

Experimental Design

[8] The project included a purposive sample of healthcare policy elites including policy makers, experts and industry representatives (N = 314). Because the focus of this research is policy preferences of the general public, we use only the population sample.

A subset of participants in the baseline survey (*N* = 1,844) was asked to participate in subsequent pre- and post-discussion surveys. Among these individuals, 1,237 were randomly assigned to attend four rounds of online discussions that took place between September 2004 and May 2005 in addition to the surveys. Those in the treatment group were divided into 72 discussion groups. The first (September 2004) and second (November 2004) discussions pertained to issues surrounding health insurance. In the first discussion, participants deliberated about the most pressing problem related to health insurance, and each group identified one problem as a top priority. 27 groups named the large number of Americans without insurance coverage, while 45 groups named the increasing costs of health insurance. In the second round, participants discussed the pros and cons of several policy proposals designed to address the specific problem selected by the group in the first discussion. Each discussion was held for an hour. On average, deliberation participants made 18.6 (first round) and 20.2 (second round) statements at each event. Since we rely on open ended questions tapping awareness of arguments for and against a "universal, federally funded health insurance," our analyses exclusively drew on the first two deliberation meetings and the two waves of surveys conducted before the first and after the second deliberations (see Table 1).[9] Appendix B shows that the treatment and control groups are balanced on pre-treatment covariates among those who responded to the baseline and post surveys, minimizing concerns that differential attrition is responsible for the results shown below.

Non-compliance.

[9] The third and fourth discussions and surveys were concerned with prescription drugs.

Although substantial efforts were made to motivate participants to attend the discussions by accommodating their schedules, sending reminders and offering incentives (e.g., $15 in wave 2), among the 1,237 invitees, only about 30% were present in deliberative meetings (376 in the first and 355 in the second). We take three estimation strategies to deal with the non-compliance issue. First, we regress opinion change on random *assignment*, estimating the Intent-to-Treat Effect (ITE). Albeit valid, ITE is a smaller than average treatment effect (ATE) because many of those assigned to be treated never receive the treatments. Second, we use a two-stage-least-square (2SLS) estimator where random assignment is used as the instrument for attendance. This approach recovers the ATE on the Treated (ATET). One should assume, however, that compliers and non-compliers would be affected by the treatment in the same way in order to generalize findings to the population. To estimate the ATE, we use simple Difference-in-Differences (DD) estimators treating deliberation *attendance* as the independent variable, which *can* be generalized to non-compliers. The downside is that this strategy is essentially "observational"; since deliberation attendance is likely endogeneous it requires an additional identifying assumption that the overtime opinion change would have been the same for attendees and non-attendees in the absence of deliberation.

Measures

Support for universal health insurance. At the baseline survey, participants indicated their views on "a universal, single-payer system of national health insurance paid for by the federal government." The same question was asked in the post survey, which was fielded about two months after the round two deliberations. This variable was coded on a scale from 0 ("oppose strongly") to 1 ("favor strongly"), with the midpoint representing "don't know" responses.

Consideration of pro and con arguments. After being asking about one's opinion on universal health insurance, those who were favorable to the program were then asked to offer *all* the reasons they have for being in favor of a universal, national health insurance program. They were then asked to give reasons "other people" might have for being opposed to the program. Similarly, participants who were opposed to a universal health insurance program were asked to give rationales for their own and for others' views. Those who did not take a position were asked to name the reasons why other people might favor a universal health insurance, followed by a question asking about reasons for being against it. Thus, all respondents were invited to offer both pro and con arguments about a federally funded health insurance program, regardless of their opinion.

The number of pro and con arguments was counted by four independent coders, using the coding procedure developed and implemented by Cappella and his colleagues (2002). Answers without evidence (e.g., "it makes sense"), restatement of opinion, repetition of the same ideas and the like were not counted. Evidence coupled with stated or implied explanation as to why that evidence supports/opposes universal national health insurance was counted as a reason (argument). A subsample of 50 responses was randomly drawn and coded by all of the coders to test inter-coder reliability. Krippendorff's alpha value for reliability was .83 for pro reasons, and .85 for con reasons. Overall, people supplied similar numbers of pro arguments ($M = 2.30$, $SD = 2.69$) and con arguments ($M = 2.17$, $SD = 2.74$).

Political information. The *Healthcare Dialogue Project* assessed general political knowledge as well as specific healthcare issue knowledge in the baseline survey. General knowledge was measured by an additive index of the number of correct answers to the five questions recommended by Delli Carpini and Keeter (1996, 306). The seven questions tapping healthcare issue knowledge included knowledge about provisions of the Medicare bill signed by President Bush; which organization was responsible for deciding whether drugs are ready for use; the political office held by Tommy Thompson; the amount of Medicare's fund; the Bush administration's position on stem cell research; eligibility requirements for Medicare; and the percentage of Americans without health insurance. We created an additive index of political information by counting the number of correct responses to all 12 items (M = 7.20, SD = 2.47, α = .72).

Party identification. Conventional questionnaires (e.g., ANES) were used to measure partisanship. Respondents were categorized into five (partisan) groups: Strong Republicans (16.1%), Moderate Republicans (16.5%), Independents (34.5%), Moderate Democrats (16.4%), and strong Democrats (16.5%).[10]

Control variables. Some of statistical models to be reported below include a range of covariates. They include age (Mean = 44.7), years of education (Mean = 14.2), gender (Male = 46.6%), income (Median = $50,000), Black (8.4%), marital status (Married = 64%), political interest, political participation, political discussion, attention to news about healthcare issues, access to health insurance (insured = 87%), one's own health status (36.0% have a serious disease), and family health status (42.5% have a family member with a serious disease). See

[10] Those indicated "something else" (N = 170) were categorized as independents.

Appendix C and D for more detailed information the measurement of the control variables. The appendices also provide survey question wordings of the independent dependent and control variables, and their descriptive statistics. Unless noted otherwise, all variables are recoded to vary between 0 and 1.

RESULTS

Distinguishing Information and Consideration

A limitation in the classic notions of political knowledge and informed opinion, we have argued, is that it ignores the possibility of biased sampling of incoming political information. In this section, we examine this possibility empirically, using the distinction we drew between two dimensions of political knowledge. If the partisan "perceptual screen" affects the sampling of received information, citizens will fail to receive both sides of an argument equally. And to the extent that some citizens are "better informed," their awareness of opposing arguments is likely to be slanted. If there is little partisan bias in information selection, those who appear "well informed" according to the classic definition would have considered more or less balanced sets of competing arguments, in which case information and consideration would be essentially the same thing. In Figure 1 (above) we presented two hypothetical scenarios, where such biased learning is completely absent (left panel) or extremely strong (right panel).

[Figure 2 about here]

In Figure 2 we match the actual data against the two hypothetical possibilities outlined in Figure 1 (see Table A5 in the Appendix E for specific numbers including number of observations and standard errors).[11] The solid lines plot the mean values of pro and con arguments provided by each partisan group, with the four markers in each group representing levels of political information.[12] As can be seen, partisans tend to diverge from the diagonal "benchmark" of balanced consideration, in the direction of the position most closely associated with their partisan identity. People were better aware of the arguments for their side, and this pattern was largely driven by "knowledgeable" citizens. Especially "well-informed" strong Republicans seem to have ignored pro-healthcare reform arguments as they mention just about the same number of arguments *for* universal healthcare as their uninformed counterparts (1.86 vs 1.72), although they were able to articulate far more con arguments than less informed ones. Similar, albeit less pronounced, patterns can be found for moderate Republicans and strong Democrats. Independents and moderate Democrats appear to exhibit fairly well balanced consideration on average.

Now, we provide a more formal examination of the tendencies highlighted in Figure 2: (1) partisan gaps in the awareness of pro and con arguments, and (2) the pattern of where partisan gaps are widest among the well informed. To do so, we fit a set of regression models

[11] As a general principle, we start from simple (transparent) specifications, and then move onto more complicated models, checking the robustness of findings. In these "simple" models, we treat the key independent variables (e.g., PID and political information) as categorical, and compare group means.

[12] We use a quartile split to divide the respondents into four levels of political information, with the following cutoffs: 42% or less, 50%, 67%, 83% correct answers, which roughly correspond to the quartiles.

where the number of pros and cons are the dependent variable.[13] First consider a regression model:

$$AR_{i,j} = \alpha + \beta_1 Pro_j + \gamma_1 PID_i + \gamma_2 Pro_j \times PID_i + \delta_i + \varepsilon_{i,j} \quad (4)$$

where the *j* subscript indexes arguments (pro or con), the *i* subscript indexes each participant, $AR_{i,j}$ is the number of arguments, Pro_j is a within-individual factor dummy variable indicating argument position (pro =1; con=0), PID_i is a vector of dummy variables for partisan identities where strong Republicans serve as the reference category, δ_i is individual-specific random effects $\varepsilon_{i,j}$ is the stochastic error term,[14] α is the average number of cons articulated by strong Republicans (the reference category), β_1 is the difference between the number of pros and cons (for strong Republicans), γ_1 is the vectors of parameters for the PID dummies summarizing partisan differences in the number of cons, and γ_2 is the interaction between PID and argument position indicating the partisan differences in the gap between the number of pros and cons. If there is a partisan bias in consideration of pro and con arguments, the difference between pros and cons (i.e., the coefficient on Pro_j) will vary across partisan groups. This can be demonstrated by fitting Equation 4 where the value of the coefficient on argument position can depend on PID, and comparing it against a reduced model restricting the interactions (γ_2 vector) to be zero. A likelihood-ratio test suggests that the model including the interaction terms fits significantly

[13] In these regression models, there are two observations of the dependent variable (pros and cons) for each respondent.

[14] Four dummy variables for PID were included in the model, with the base category representing strong Republicans. We fit a Maximum Likelihood model to account for the individual random effects.

better than the restrictive one (Chi^2 (4) = 91.61, $p < 0.001$), providing strong evidence that the distributions of pros and cons that underlie people's opinion substantially differ by PID.

[Table 2 about here]

Table 2 reports the estimates of $\beta_1 + \gamma_2$ (i.e., average gap between pros and cons for each partisan group), which ranges from -1.08 to 0.77 in the expected direction (see Appendix E for a full report on the estimates of Equation 4). How does each partisan group measure up in terms of balanced awareness? One can think of two benchmarks here; assuming that the information flows about the issue in public discourse were evenly balanced, one may define unbiasedness as $Pro - Con = 0$. By this standard, every group appears to be biased beyond chance, except for moderate Republicans. But assuming that Independents lack a partisan slant, the fact that they also named more pro arguments may indicate the range of arguments brought to the citizenry overall is slightly slanted in favor of universal healthcare. Alternatively, Independents can serve as a benchmark. By this standard ($Pro - Con = 0.33$), all but moderate Democrats significantly deviate from the benchmark. In either case, strong partisans exhibit slanted distributions of considered reasons.

Next, to examine the correspondence between information and consideration we estimate a regression that extends Equation 4 by including political information, and its interactions with PID and argument position, which takes the form:

$$AR_{i,j} = \alpha + \beta_1 Info_i + \beta_2 Pro_j + \beta_3 Info_i \times Pro_i + \gamma_1 PID_i + \gamma_2 Info_i \times PID_i + \gamma_3 Pro_j \times PID_i + \gamma_4 Info_i \times Pro_j \times PID_i + \delta_i + \varepsilon_{i,j} \quad (5)$$

where $Info_i$ is political information of respondent i, α is now the predicted number of cons mentioned by least informed strong Republicans (who served as the reference category), $\alpha + \beta_2$ is the predicted number of pros for strong Republicans with the lowest political information score; $\alpha + \beta_1$ is the fitted value of cons for "fully informed" ($Info_i = 1$) strong Republicans, and $\alpha + \beta_1 + \beta_2 + \beta_3$ is their predicted number of pros, β_1 is the difference between least informed and most informed strong Republicans in the number of *con* arguments, and $\beta_1 + \beta_3$ is the difference in number of *pros*. The difference ($\beta_1 + \beta_3 - \beta_1 = \beta_3$) is the asymmetry in the association between information and consideration of pros versus the association between information and consideration of cons. It captures the extent to which the slope representing strong Republicans in Figure 2 diverges from the diagonal benchmark, i.e., the extent to which information and consideration do *not* correspond. Alternatively, one can interpret β_3 as the extent to which the pro versus con difference is strongly pronounced for well-informed strong Republicans ($\beta_2 + \beta_3$), compared to the less informed (β_2).

γ_4 is the vector of coefficients on the triple interaction terms representing the extent to which the asymmetric correlations differ by PID. If the relationship between information and the range of considered reasons is unaffected by PID, a model that restricts the triple interactions to zero should perform as well as a flexible model that allows γ_4 to be non-zero. A likelihood-ratio test easily rejects this null hypothesis in favor of the possibility that partisanship influences the differential correlations between information and pro and con arguments (*Chi*^{2} (4) = 23.89, $P <$ 0.001).

[Table 3 about here]

The estimates of Equation 5 are summarized in Table 3, which shows the predicted difference in the number of pros between the least and most informed respondents in each partisan group ($\beta_1 + \beta_3 + \gamma_2 + \gamma_4$), as well as their predicted difference in the number of cons ($\beta_1 + \gamma_2$). Also reported is $\beta_3 + \gamma_4 = (\beta_1 + \beta_3 + \gamma_2 + \gamma_4) - (\beta_3 + \gamma_4)$, indicating the gap in these two correlations (see Appendix E for a full report on the estimates of Equation 5). As with the previous model, there may be two benchmarks. One may presuppose that "well informed" citizens should do better, compared to less well informed ones, *in articulating both pros and cons to the same extent*. In this the case, $\beta_1 + \beta_3 + \gamma_2 + \gamma_4$ should not be significantly different from $\beta_1 + \gamma_2$. This "null" hypothesis ($\beta_3 + \gamma_4 \ = 0$) is tantamount to assuming that the slopes in Figure 2 will parallel with the diagonal. As demonstrated in Table 3, Republicans, especially strong ones, clearly fall short of this standard. The relationship between information and consideration for strong Democrats appears to be slanted in the opposite direction, although to a much lesser degree ($\beta_3 + \gamma_4 = 0.99$, $p = 0.18$). According to an alternative standard provided by Independents ($\beta_3 + \gamma_4 = -0.44$), all but leaning Democrats show asymmetric relationship between information and consideration.[15]

[15] The mismatch between information and consideration is particularly severe for Republicans. Although we did not hypothesize it, this finding is in fact consistent with studies showing that conservatives tend to avoid dissonance-arousing situations (Nam et al., 2013), including

Taken together, the correspondence between being *informed*, and being *considerate* is far from perfect, and therefore there is little ground for treating these two characteristics as the same. Thus even a well-informed public's decisions may not approximate the decisions that a well-considered public would make. We explore this possibility in the following sections.

Informed Opinions versus Considered Opinions

In this section we compare informed opinions and considered opinions. As mentioned above, we use statistical simulation (and an experiment) to estimate them. But before presenting the relatively complex models, we first outline how people's opinions differ across different levels of information and consideration using mean comparisons. Table 4 compares the average support for universal healthcare of better informed and less informed citizens, using a quartile spilt. We find a significant (monotonic) negative correlation between political information and the view that universal health insurance is a good idea. The difference between the most informed and least informed citizens is quit sizeable (mean difference = –0.16, $p < 0.01$), with the former being evenly divided and the latter being generally supportive.

[Table 4 about here]

Does the same result arise when using consideration as the measure of political knowledge? To examine this question, we compare the mean support for universal healthcare of

exposure to counter-attitudinal information more than liberals (Garrett and Stroud 2014; Mutz 2006, 33).

those who are fairly "well considered" against the rest of the respondents in Table 5.[16] We find that those who are well versed in both sides of arguments are *more* supportive of universal healthcare than others, contrary to what was found for "well informed" respondents. For example, the respondents who articulated five or more pros *and* five or more cons were substantially more likely to approve the universal health insurance policy than the rest (mean difference = 0.11, $p < 0.01$). Taken together, the mean comparisons reported in Tables 4 and 5 provide preliminary evidence that the opinions held by knowledgeable citizens differ depending on how one defines and measures political knowledge.

[Table 5 about here]

To be sure, the group means in Tables 4 and 5 are only crude measures of "informed" and "considered" opinions.[17] We next follow the imputation methods developed by Delli Carpini and Keeter (1996) and Bartels (1996) to generate estimates of the counterfactual collective opinions held by the "fully informed" public, and the "fully considered" counterpart, while accounting for the most likely confounders and heterogeneity in the effects of information and consideration (for similar approaches to simulating other counterfactuals, see Kuklinski et al.

[16] Given the uncertainty regarding how many arguments one should articulate to qualify as exhibiting high levels of consideration, we use various cutoffs: from three pro and three con arguments to seven pros and seven cons. Unsurprisingly, the number of respondents categorized to have balanced consideration decreases rapidly as the definition of balanced consideration becomes more demanding (from about 16.3% to 1.6%).

[17] They do not account for likely confounding factors such as PID, and implicitly assume that people will be equally affected by political information and considered arguments.

2000; Zhang 2010). First, we estimate the effects of political information based on a regression model that takes the following form:

$$Y_i = \beta_0 + \beta_1 Info_i + \varepsilon_i. \qquad (6)$$

where Y_i is support for a universal health insurance for individual i, $Info_i$ is political information, β_0 is the average support among those who are lowest in political information, and β_1 is the effect of information.[18] Given that people with different political values or self-interests will (rationally) use differential evaluative criteria, we allow these parameters to vary across individual differences by adding a set of moderators to Equation 6. To ensure that the results are not sensitive to the choice of individual factors, we try alternative specifications. In a more restrictive (but simple) variation of Equation 6, we include only party identification and its interaction with political information. A second specification includes demographic characteristics that are likely to affect the evaluative criteria, in addition to party identification.[19] Based on the estimated parameters, we simulate an "informed" public opinion by setting $Info_i$ to be the highest possible value (100% correct) for everyone and calculating the average of imputed Y_i. Accordingly, the differences between the counterfactual and the observed opinions

[18] $Info_i$ is now a continuous variable ranging from 0 to 1.
[19] The demographic variables include a variety of stable characteristics pertinent to healthcare policy preferences (see Appendix E, for the full list). They are similar to those used in previous research (e.g., Althaus 1998), but also include several variables tapping personal health status, and healthcare conditions (e.g., whether insured or not). In the regression analysis, these variables and their interaction with political information are added to Equation 6.

constitute the anticipated opinion change upon each individual becoming "fully informed." And the mean of these differences is taken to be the "information effect."

For considered opinions, we begin by measuring the effects of considering arguments *for* a universal healthcare system, and the effects of considering arguments *against* by fitting (an extended version of) the regression model:

$$Y_i = \beta_0 + \beta_p k_i + \beta_c (n_i - k_i) + \varepsilon_i. \qquad (7)$$

where β_p and β_c are the effects of pro and con considerations, and k_i and $n_i - k_i$ are again, the numbers of pros and cons underlying individual i's opinion.[20] As with Equation 6, we allow these effects to vary across individual differences using two different specifications; one including PID only and the other adding demographic factors.[21] The key difference from "informed" opinion is that this time we set both k_i and $n_i - k_i$ to be equally high numbers for everyone, thereby forcing a balance in pros and cons—a feature that is absent in the estimate of "informed" opinions.[22]

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[20] One can think of Equation 7 as a simplified version of Equation 3, which cannot be estimated as it is. The simplification is that for individual i, all pro arguments are equally effective, as are all con arguments.

[21] We also examined models that included interactions between pros and cons, allowing for the possibility that the effect of one side of arguments depends on awareness of the other side. The results were robust to this specification choice (See Appendix E). We report the results from the simpler specification without the interaction term here.

[22] Pro and con arguments had extremely skewed distributions; while the maximum values were 42 and 48 respectively, for the most part respondents articulated five or less arguments for each side (87.5% fall in this range for pros and 87.6% for cons). In fact, only one respondent listed more than 15 pros and 15 cons (see also Figure A1 in Appendix D). Given the sparseness of observations near the actual maximums, "fully considered opinions" fixed at these values will be mere extrapolations. Consistent with the mean comparison analyses (reported in Table 5), we

[Figure 3 about here]

The results of these various models are presented in Figure 3.[23] The circles and triangles in the left half of the figure compare the imputed estimates of information effects against consideration effects (with and without demographic moderators). Each marker represents the point estimate of the difference between imputed informed or considered public opinion and the baseline of actual public opinion. The bars report the 95% confidence intervals. As shown in the figure, imputed opinions significantly differ from actual public opinion. More importantly, considered and informed public opinions differ from actual opinion *in the opposite direction*. The estimated values suggest that, while informed public opinion is *less* favorable to a nationalized health insurance program than actual collective opinion by 4.4 to 7.1 percentage points (both statistically significant at $p < .05$), considered public opinion is *more* favorable. The size of the "consideration effect" reported here varies somewhat—from 2.9 to 4.9 percentage points—but these estimates are consistently positive, and the lower bounds of the 95% confidence intervals remain above zero with and without additional moderators in the model. In sum, this analysis suggests that the consideration effect on collective opinions significantly diverges from the

employ more reasonable definitions of "full consideration"—5 pros and 5 cons, and set the maximum of number of arguments to be 5, by collapsing values greater than 6 into the maximum category. Findings are generally robust to alterative specifications using different cutoffs—3 or 7 arguments on both sides—and using percentile values, which does not require (arbitrary) selection of cutoffs (See Appendix E).

[23] The confidence intervals and standard errors are calculated using bootstrapping. Each set of analyses—i.e., regression and simulation—are replicated on 2000 bootstrap samples drawn from the original sample with replacement. Thus the standard error and confidence interval for fully informed preference are the standard deviation, and 5th and 95th quintiles of its values from the 2000 samples.

information effect, not only in magnitude, but also in direction. This discrepancy seems to imply that so-called “fully informed” public opinion (Althaus 2001; Bartels 1996; Delli Carpini and Keeter 1996) may reflect partisan bias in awareness due to the failure to impose the restriction that knowledge of competing arguments is balanced.

It is important to note, however, that the statistical imputation approach still requires some strong modeling assumptions, particularly that there is no unobserved confounder. We now turn to a randomized experiment on deliberation as a means to measure the *causal* effect of consideration. If imputation and experimentation are both valid tools for identifying more considered opinions, we should find that these estimates correspond to one another. We fit the following regression model:

$$\Delta Y_i = \beta_0 + \beta_1 Del_i + \varepsilon_i \quad (8)$$

where ΔY_i is change respondent *i*'s support for universal healthcare system before and after deliberations, Del_i indicates deliberation, and β_1 is the causal effect of interest. As mentioned above we use three different specification approaches—(1) ITT, (2) ATET, and (3) ATE. The difference among the three is how deliberation is operationalized—(1) assignment, (2) assignment as the instrument for attendance, and (3) attendance.[24] We fit each of the specifications with and without covariates, yielding a total of 6 estimates of deliberation effects (see Appendix E for full reports of these models including the list of controls). The rectangular markers in the right half of Figure 3 report β_1 in Equation 8, across these specifications.

[24] Attendance is coded as the following; 0 = none; 0.5= once; 1 = twice.

We first present the result of regressing opinion change on group assignment status (without controls), which shows a treatment effect that is consistent with the imputed estimates of *consideration* effect (β_1 = 0.031, p = 0.056).[25] The next model, shown in the second rectangle, adds the long list of control variables, but still produces a remarkably similar figure (β_1=.030; p = 0.074). These two estimates capture the "intention-to-treat" effect, which represents the impact of being assigned to a treatment group, while ignoring the rate at which those in the treatment group actually receive it. To calculate the ATET, we turn to 2SLS regression (the third and fourth triangles in Figure 3).[26] We find that actual treatment (i.e., deliberative participation) increases support for universal healthcare system by 7.8 to 8.2 percentage points for those would receive treatment when assigned. Finally, comparing individuals on (endogenous) deliberation attendance, we find the effect of deliberating about healthcare corresponds to 3.6 percentage points greater support for universal healthcare system, compared to non-deliberators (p = 0.067). And holding fixed individual factors *increases* the size of the point estimate (β_1=.046; p =0.028), implying that omission of some potential confounders, if anything, may have led to *underestimation* of the deliberation effect.[27] Taken as a whole, Figure 3 makes a very straightforward point: across various specifications, deliberation moves public opinion in the

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[25] All test statistics are calculated using robust cluster standard error that accounts for within-discussion-group correlations. We rescale the number of deliberations participated in to range between 0 (none) and 1 (twice). See Appendix E for more information on the models.
[26] ATET is identical to the ITT effect divided by the average rates of deliberative participation among the treatment group.
[27] Note that the latest deliberation took place about two months before the measurement of the post-test outcome variable (Table 1). Considering that communication effects in general tend to disappear rather rapidly (e.g., Gerber et al. 2011), this result is impressive.

direction predicted by our simulation of "considered opinion," which is at odds with "informed opinion."

To summarize, our analyses have underscored the discrepancy between two dimensions of political knowledge—information and consideration—by providing the following evidence. First, the range of considered argument is generally slanted in the direction of partisan identities, and this tendency is far stronger among those who possess high levels of factual information. Second, the statistical simulations of considered and informed preferences indicate that they are not the same thing, significantly diverging on preferences for government-sponsored health insurance. Third, on average, deliberative intervention—an experimental method for producing considered opinions—pushed public opinion in the same direction predicted by the imputation method.

DISCUSSION

A substantial body of theory and research has argued that "informed citizens are demonstrably better citizens, as judged by the standards of democratic theory and practice underpinning the American system" (Delli Carpini and Keeter 1996, 272). Such citizens, it was found, are more engaged, better able to translate their interests into opinions, more likely to support democratic norms, and more likely to have stable opinions. However, more recent research has dampened this optimism, suggesting that politically knowledgeable citizens are more likely to develop systematically biased empirical beliefs, to align their opinions with their previously held values (e.g., Bartels 2008, 153-161; Wells et al. 2009; but see Prior et al. n.d.), to respond to partisan polarization among elites in ways consistent with their own partisanship (e.g., Abramowitz 2010), and to engage in even more biased information processing and be more likely to polarize as a result (e.g., Taber and Lodge 2006). The research presented is an attempt to reconcile these disparate literatures with a more nuanced conceptualization and measurement of political knowledge.

In American politics, controversies surrounding policy proposals rarely come down to a simple black and white choice. Almost every policy option entails trade-offs, with legitimate rationales for supporting or opposing them. In this regard, democratic decision making necessitates taking potential advantages *and* disadvantages into consideration as one forms his or her opinion. Obviously, those who do not possess *any* knowledge about politics are not likely to make political decisions in such a fashion. They may not have any meaningful opinions at all (Converse 1964). But those who know only the advantages (and not disadvantages) of his/her choice also risk making choices that fail to reflect their interests or their conception of the public interest.

This risk and its collective implications become even more complicated if those who are "well informed" by conventional measures depend on a more slanted distribution of considerations than the uninformed. Our study provides evidence that the range of considered arguments is generally slanted in the direction of partisan identities, and that this tendency is far stronger among those who possess high levels of factual information. Clearly this raises important issues regarding the civic competence of the knowledgeable, and even what one means by concepts such as "informed opinions" or "political knowledge." To be clear, nothing in these findings questions the beneficial role of factual information for democratic decision making. It does suggest, however, that the ways in which citizens receive and process political information do not necessarily lead them to "fully consider" the merits and perils of the choices they make.

Given the skewed distribution of argument repertoires among the well informed, it is not surprising that statistical simulations of considered and informed preferences show that they are not the same thing, significantly diverging on support for a universal healthcare program. Taken together these findings call for a conceptual distinction between "informed" opinion (e.g., Althaus 1998; Gilens 2001), and "considered" opinion (e.g., Luskin et al. 2002), concepts which have been used interchangeably in the literature (e.g., Fishkin 1995; Price and Neijens 1998). Citizens could have a large base of information about politics and yet their opinions may still be ill considered.

We believe the current attempt to revisit the normative benchmark of informed citizenship represents an important step forward in the long process of resolving the controversy around the benefits of political knowledge. It is only a step, nonetheless. There are at least two points of disagreement that require future research. First, assuming citizens are provided with information, are they capable of effectively using it, and thereby making competent decisions? Our study suggests that public opinions may be significantly reshaped *if* the citizenry brings to bear a broad and balanced range of information—seemingly a reason to promote informed citizenship, but perhaps with a better understanding of the concept. On the other hand, our analyses ignore the issue of *how* people use knowledge. The normative implications of this finding ultimately depend on the extent to which people refine their opinion in light of the quality of information, rather than, for instance, some superfluous cues imbedded in messages (see Zaller 1992).

Secondly, as for the idiosyncratic behaviors of “informed” citizens, some of which are arguably less desirable (e.g., Taber and Lodge 2006) than others (e.g., Delli Carpini and Keeter 1996), there remains a great deal of uncertainty regarding the specific causal pathway—whether it is political knowledge *per se*, or something that is correlated with knowledge that makes the knowledgeable sometimes inconsistent with the classic democratic ideal. Our research here seems to imply that the limitations in conceptualization and measurement that have failed to purge political knowledge of biased awareness may be the reason for some of the apparent perils of “sophistication.” But this is only a tentative explanation. The key difficulty ultimately lies in the fact that general political knowledge does not really seem experimentally manipulable, which has denied scholars the opportunity to make strong causal claims (see Levendusky 2011).

The approach taken in this study to revisit the classic definition and measurement of political knowledge does not represent the only way to go. Perhaps the most important contribution of this study is not on the answers it provides, but rather on the questions it raises, calling for further endeavors: What does it mean to be well informed? How can we observe it? And what are its consequences?

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Table 1: The Health Dialogue Project

Date	Event	Key Variables / Discussion Topics	N
7/14 to 8/12 (2004)	Baseline Survey	Political Information Argument Repertoire Opinion: Nationalized Universal Healthcare (1) Party Identification Control Variables	2,193
9/17 to 9/23	Deliberation 1	The most pressing problem	376
11/30 to 12/6	Deliberation 2	Policy proposals for the selected problem	355
2/4 to 3/1 (2005)	Post Survey	Opinion: Nationalized Universal Healthcare (2)	1,340

Table 2: Gap between Pros and Cons by PID

(1) Strong Rep	(2) Mod. Rep	(3) Indep.	(4) Mod. Dem	(5) Strong Dem
-1.077[ab]	-0.13[b]	0.33[a]	0.53[a]	0.77 [ab]
(0.15)	(0.15)	(0.10)	(0.15)	(0.15)

Note. Entries are calculated by estimating Equation 4. Standard errors are in parentheses. N = 4,340. [a] $P < 0.1$ where $H_0: \beta = 0$. [b] $P < 0.1$ where $H_0: \beta = 0.33$.

Table 3: Associations between Information and Consideration of Pros and Cons by PID

	(1) Strong Rep	(2) Mod. Rep	(3) Indep.	(4) Mod. Dem	(5) Strong Dem
$\beta_1 + \beta_3 + \gamma_2 + \gamma_4$ (Pros)	0.08	2.13	2.94	3.08	5.56
	(0.88)	(0.61)	(0.43)	(0.59)	(0.70)
$\beta_1 + \gamma_2$ (Cons)	4.22	4.00	3.38	3.48	4.57
	(0.88)	(0.61)	(0.43)	(0.59)	(0.70)
$\beta_3 + \gamma_4$ (Gap)	-4.15[ab]	-1.87[ab]	-0.44	-0.41	0.99[b]
	(0.98)	(0.61)	(0.48)	(0.60)	(0.74)

Note. Entries are calculated by estimating Equation 5. Standard errors are in parentheses. N = 4,340. [a] $P < 0.1$ where $H_0: \beta_3 = 0$. [b] $P < 0.1$ where $H_0: \beta_3 = -0.44$.

Table 4: Support for Universal Health Insurance by Political Information

Political Information	Support
Very Low	0.64
	(0.01)
Low	0.63
	(0.01)
High	0.58**
	(0.01)
Very High	0.49**
	(0.01)
F (3)	24.02**

Note. N = 2,193. Standard errors in parentheses. *$p < 0.05$ ** $p < 0.01$. The p values on each level are for the mean comparisons against the baseline category (Very Low). The F statistic (with 3 degrees of freedom) tests the null hypothesis that the mean differences are jointly zero.

Table 5: Support for Universal Health Insurance by Consideration

Consideration	Support		
Balanced	0.63*	0.70**	0.71*
	(0.02)	(0.03)	(0.06)
Rest	0.59	0.59	0.59
	(0.01)	(0.01)	(0.01)
Cutoff for Balanced Consideration	3 or more	5 or more	7 or more
Observations Passing Cutoff	358	105	35

Note. N = 2,187. Standard errors in parentheses. $*p < 0.05$ $** p < 0.01$. The p values are for the mean differences between Balanced and Rest.

Figure 1: Political learning with and without partisan bias

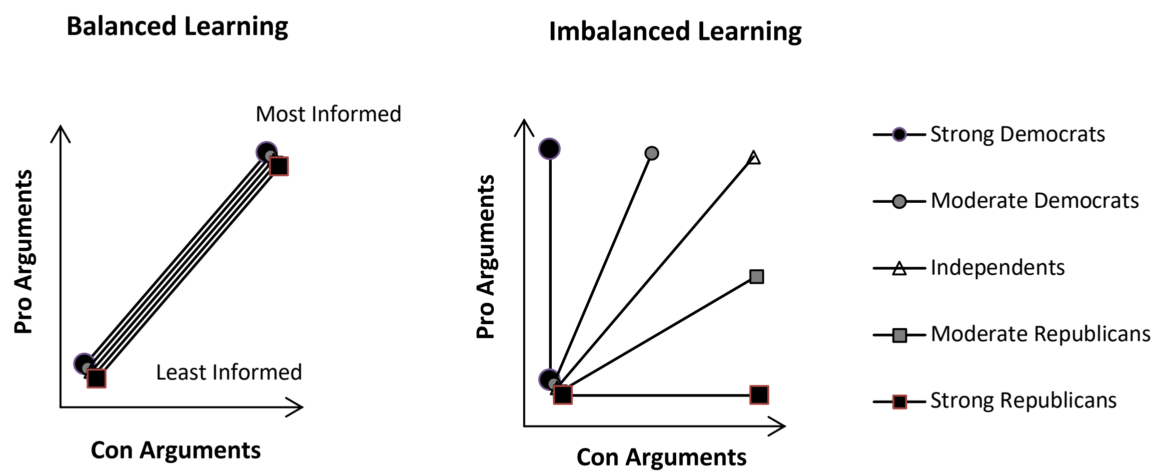
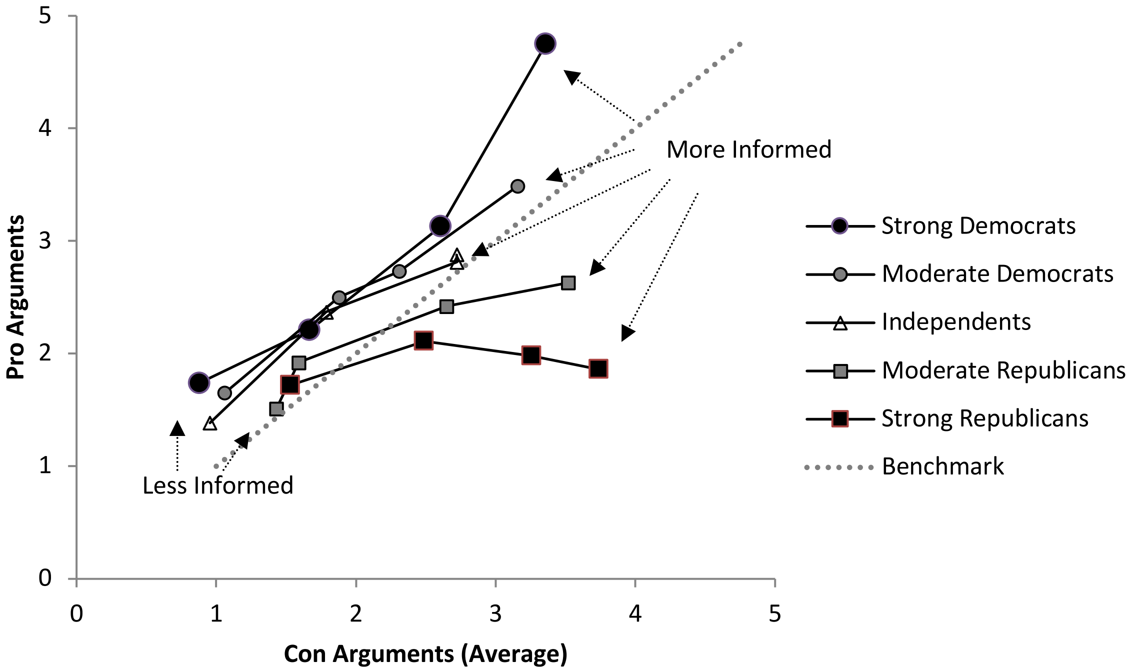
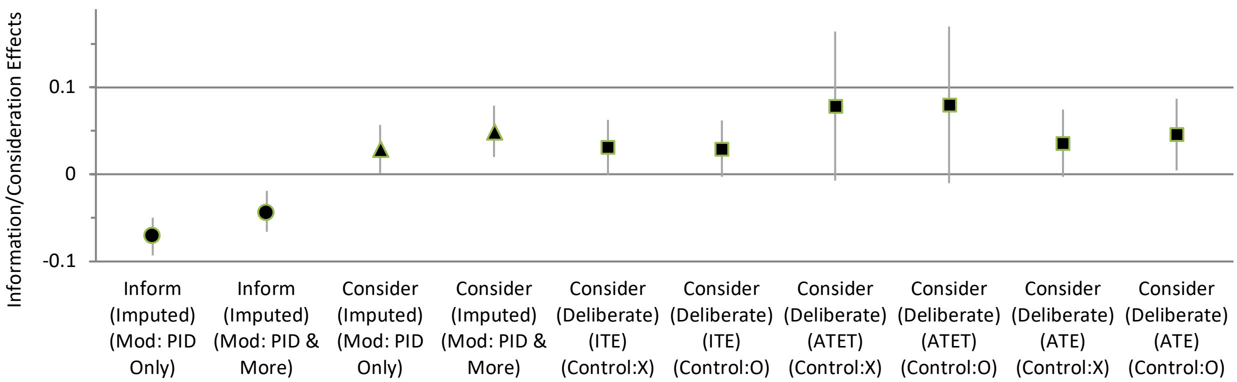


Figure 2: Observed Relationship Between Information and Consideration



Note. N = 2,193. The mean values of pro and con arguments are plotted by PID and political information.

Figure 3: Comparing Information Effects versus Consideration Effects



Note. The dependent variable is change in support for universal health insurance. Information Effects, denoted by the circle markers, represent the simulated estimates of public opinion change that is anticipated when the public is fully informed. Imputed Consideration Effects, denoted by the triangular markers, represent the simulated estimates of public opinion change anticipated to occur when the public considers a “full” range of competing arguments. Deliberation effects, denoted by the square markers, represent the estimated effect of actual deliberation on opinion change. Vertical lines represent 95% confidence intervals. See Appendix E for more information.

Appendix A. Sample Characteristics[1]

This Appendix compares characteristics of the Health Dialogue Project to 2004 American National Election Study (ANES), against the American adult population as documented by the 2004 Current Population Survey (CPS) from the U.S. Census Bureau. Overall, as shown in Table A3, the characteristics of HD sample were fairly similar to the ANES sample, and the CPS benchmark. While those in the HD sample were somewhat more educated, and more likely to be married than the ANES and CPS data, the HD sample resembled the CPS benchmark more closely than the ANES sample on age, income, and race (White).

Table A3. Health Dialogue Sample Characteristics Compared to ANES and CPS

Variables	Health Dialogue N = 2,193	2004 ANES N = 1,211	2004 CPS N = 226,672
Age (Average)	44.7	47.3	43.7
Female (%)	53.4	53.3	51.7
Bachelor's Degree (%)	34.7	29.9	23.7
HH Income $ 50,000 or Higher (%)	52.5	48.0	52.3
Access to Health Insurance (%)	86.8	85.9	84.2
White (%)	78.7	72.7	81.7
Black (%)	8.3	15.0	11.7
Married (%)	64.2	51.6	53.2
Northeast (%)	18.9	18.0	19.0
Midwest (%)	22.2	25.9	22.6
South (%)	35.2	34.4	35.8
West (%)	23.4	21.7	22.6
Strong Democrat (%)	16.5	17.0	NA
Moderate Democrat (%)	16.4	15.0	NA
Independent (%)	34.5	39.0	NA
Moderate Republican (%)	16.4	12.9	NA
Strong Republican (%)	16.5	16.2	NA

Note. CPS results were derived from CPS Table Creator.[2]

[1] Appendices are intended to be made available online only.
[2] http://www.census.gov/cps/data/cpstablecreator.html

Appendix B. Balance Check

In this Appendix, we provide balance statistics. Treatment and control groups are balanced on pre-treatment covariates among those responded to the baseline, and post surveys, minimizing the concern that differential attrition introduced imbalances. As shown in Table A4, the coefficients on each variable and the F-statistics are insignificant (at $p < 0.05$) and the R-squares are very small. In addition, Table A4 shows that group assignment did not significantly affect attrition, further mitigating the concern that differential attrition is responsible for the results.

Table A4. Balance Check

	DV= Assigned to Deliberate		DV= Assigned to Deliberate (If Completed Post Survey)		DV= Competed Post Survey	
	Coef	SE	Coef	SE	Coef	SE
Support for Universal Healthcare (0-1)	0.01	0.04	-0.04	0.05		
Pro arguments (0-42)	0.01+	0.00	0.01	0.01		
Con arguments (0-48)	0.00	0.00	0.00	0.01		
Political Information (0-1)	0.02	0.07	0.02	0.08		
Party ID (0-1, 1=strong Dem)	-0.04	0.04	-0.01	0.05		
Age (0-1, 0 = 18, 1=94)	0.04	0.06	0.00	0.08		
Years of Education (0-1)	0.04	0.06	0.06	0.08		
Gender (1=male)	0.00	0.02	-0.02	0.03		
Income (0.02-1, percentile)	0.00	0.04	0.03	0.05		
Black (1=Black)	0.02	0.04	-0.02	0.05		
Marital status (1=married)	-0.01	0.02	-0.03	0.03		
Political Interest (0-1)	0.11+	0.06	0.08	0.08		
Political participation (0-1)	-0.02	0.06	-0.12	0.08		
Political discussion (0-1)	-0.08	0.05	0.02	0.07		
Attention to political news (0-1)	-0.09	0.06	-0.02	0.08		
Attention to healthcare news (0-1)	0.06	0.06	0.02	0.07		
Access to health insurance (1=insured)	0.01	0.04	0.00	0.04		
Own serious disease (1=yes)	-0.01	0.02	0.00	0.03		
Family serious disease (1=yes)	-0.03	0.02	-0.02	0.03		
Healthcare satisfaction (0-1)	-0.01	0.05	0.03	0.06		
Assigned to deliberate	0.48	0.06	0.61	0.08	-0.01	0.02
Intercept	0.48*	0.06	0.61*	0.08	0.73*	0.02
Observations	2,080		1,276		1,844	
R^2	0.010		0.009		0.000	
F	1.08		0.60		0.30	
p	0.36		0.92		0.59	

Note. OLS estimates with standard errors. + p < 0.1 * p < 0.05. Second model excludes those who did not take post-treatment surveys. Third model excludes those uninvited (via random assignment) to take the post survey. F tests fail to reject the null hypothesis that the coefficients are jointly zero.

Appendix C: Measurement and Survey Items[28]

This appendix provides information on the measurement of key variables and covariates. Since the measurement of the key independent and dependent variables is described in the main text, for these variables we simply provide the survey items here.

Some basic demographic variables used in our analyses were provided by Knowledge Networks from the respondent profiles. These include *age, education, gender, income, race*, and *marital status*. *Age* was rescaled to vary between 0 and 1. *Education* was initially measured based on seven categories. We calculated years of education by assigning the following numbers to each category: less than high school (8 years), some high school (10), high school graduate (12), some college (14), BA (16), master's degree (18), doctorate (21). We rescale this to 0-1. (Household) *Income* was measured on 19 categories, ranging from less than $5,000 to $175,000 or more. We took the percentile values, with 1 representing the highest income level. Dummy variables were created *gender* (male), *race* (i.e., Black), and *marital status*.

Political interest was measured by combining the two items, which were coded on a 0-1 scale, with 1 indicating the highest interest level and averaged (Cronbach's α=0.45).

Political participation. We counted the number of participatory activities that respondents indicate that they engage in from the list of nine activities (Cronbach's α=0.72), which was then rescaled to 0-1.

Political discussion was measured based on two items, which was averaged and rescaled to 0-1 (Cronbach's α=0.64).

[28] Appendices are not intended for publication in the journal, but to be made available online.

Attention to political was measured based on three items, which was averaged and rescaled to 0-1, with 1 indicating "very closely" (Chronbach's α=0.73).

Attention to news about healthcare issues was constructed from a single item, which was scaled to 0-1, with 1 indicating "very closely."

Access to health insurance was measured based on a single item, asking if the respondent was covered by health insurance.

Own serious disease was measured by asking if the respondent had a serious health condition. Those who noted "Yes" to both were coded 1, indicating having a serious disease or chronic health condition, and 0 otherwise.

Family serious disease was measured by asking if "anyone living in the same household" had one of the serious health condition. Those who noted "Yes" to both were coded 1, indicating having a family member with serious disease or chronic health condition, and 0 otherwise.

Survey Item Wordings

Support for universal health insurance.

Do you favor or oppose a universal, single-payer system of national health insurance, paid for by the federal government (that is, a publicly financed, but privately delivered heath care system)?

1) Favor strongly
2) Favor somewhat
3) Oppose somewhat
4) Oppose strongly
5) Don't know

Consideration of pro and con arguments (argument repertoire)

(If favorable) What are the reasons you have for being in favor of a universal, national health insurance program? (Please list *all* the reasons that come to mind)
What reasons do you think other people might have for being opposed to a universal, national health insurance program? (Please list *all* the reasons that come to mind)
(If unfavorable) What are the reasons you have for being opposed to a universal, national health insurance program? (Please list *all* the reasons that come to mind)

What reasons do you think other people might have for being in favor of a universal, national health insurance program? (Please list *all* the reasons that come to mind)
(If don't know) What are the reasons you think other people might have for being in favor of a universal, national health insurance program? (Please list *all* the reasons that come to mind)
What reasons do you think other people might have for being opposed to a universal, national health insurance program? (Please list *all* the reasons that come to mind)

Political information

Which one of the parties would you say is more conservative than the other at the national level?

1) Democrats
2) Republicans
3) Don't know

Do you happen to know what job or political office is currently held by Dick Cheney?

1) U.S. Senator
2) U.S. Vice President
3) Energy Secretary
4) Don't know

Which party has the most members in the United States House of Representatives?

1) Democrats
2) Republicans
3) Don't know

Who has the final responsibility to decide whether a law is Constitutional or not?

1) President
2) Congress
3) Supreme Court
4) Don't know

How much of a majority is needed for the U.S. Senate and House to override a presidential veto?

1) Simple majority (one more than half the votes)
2) Two-thirds majority
3) Three-fourths majority
4) Don't know

Healthcare issue information
President Bush has signed a Medicare bill to help senior citizens with prescription drugs. Which of the following is among the provisions of the new act offers a prescription drug discount program for Medicare beneficiaries

1) Allows Medicare beneficiaries to buy prescription drugs from Canada
2) Permits the federal government to negotiate with drug companies to get lower prices for those in Medicare
3) Don't know

Which of the following has responsibility for deciding when drugs are ready for use by the public?

1) FTC, Federal Trade Commission
2) FDA, Food and Drug Administration

3) APHA, American Public Health Association
4) Don't know

Do you happen to know what job or political office is currently held by Tommy Thompson?

1) State Governor
2) U.S. Surgeon General
3) U.S. Health and Human Services Secretary
4) Don't know

Many experts say that Medicare's main fund, the hospital insurance fund, will run out of money if there are no changes in the way it works. According to Medicare's public trustees, when is the fund now expected to run out of money?

1) Within about 5 years
2) In the next 10 to 30 years
3) In the next 40 to 60 years
4) Later than 70 years from now
5) Don't know

Which of the following best characterizes the Bush administration's policy concerning research on stem cells derived from human embryos?

1) Federal funds <u>cannot</u> be used to support any research on stem cells derived from human embryos
2) Federal funds <u>can</u> be used to support any research on stem cells derived from human embryos
3) Federal funds <u>can</u> be used to support research on stem cells, but only on a limited number of cell lines derived from embryos before August 2001
4) Don't know

The Medicare program provides health care coverage to the disabled and to older Americans who paid enough in payroll taxes while they worked. Which of the following best describes who is generally eligible for Medicare?

1) Age 55 or older, and earning less than $25,000 in income
2) Age 65 or older, and earning less than $25,000 in income
3) Age 65 or older, regardless of income
4) Age 70 or older, regardless of income
5) Don't know

The percentage of Americans who do not have health care insurance is closest to …

1) 5 percent
2) 15 percent
3) 33 percent
4) 50 percent
5) Don't know

Party identification

Do you generally think of yourself as a …

1) Republican
2) Democrat
3) Independent
4) Something else

(If Republican) Do you consider yourself …

1) A strong Republican
2) Not a very strong Republican

(If Democrat) Do you consider yourself …

1) A strong Democrat
2) Not a very strong Democrat

Political interest

Generally speaking, how much do you care which party wins the 2004 presidential election?

1) A great deal
2) Somewhat
3) Not very much
4) Not at all

Some people seem to follow what is going on in government and public affairs most of the time, whether there is an election or not. Others are not that interested, or are interested in other things. How much would you say you follow what is going on in government and public affairs?

1) Most of the time
2) Some of the time
3) Only now and then
4) Hardly at all

Political participation

In the last 12 months, have you personally done any of the following?

1) Contacted or written a public official about an issue that concerned you
2) Attended a public hearing or town meeting
3) Talked to anyone and tried to show them why they should vote for or against a political candidate
4) Attended any political meetings, rallies, speeches, dinners or similar events in support of a particular candidate
5) Done any other work for a candidate
6) Given money to a candidate
7) Worn a candidate's campaign button, put a campaign sticker on your car or placed a sign in your window or in front of your house
8) Contacted a newspaper or television station about an issue that concerned you
9) Tried to get another person to sign a petition

Political discussion

How many days in the past week did you discuss <u>politics</u> with your family or friends?
How many days in the past week did you discuss <u>politics</u> with acquaintances or people at work?

Attention to political news

How much attention did you pay to news stories about each of the following last week?
National politics

Local news and events
International affairs
1) very closely
2) fairly closely
3) not too closely
4) not at all

Attention to news about healthcare issues

How closely have you been following news about health care issues?
5) very closely
6) fairly closely
7) not too closely
8) not at all

Access to health insurance

Many Americans do not have health insurance. Are you now covered by any form of health insurance, including any private insurance or a government program such as Medicare or Medicaid?
1) Yes
2) No

Own serious disease

In the past 10 years, have you been told by a doctor or nurse that you have a serious or chronic health condition or disease, such as any one of the following?
High blood pressure or high cholesterol
A heart condition or heart disease
A stroke
Emphysema or other chronic respiratory condition
Cancer or malignancy of any kind
Diabetes or high sugar levels
A liver or kidney condition
Serious chronic neck, back, or joint pain
Parkinson's disease or other neurological disorder
Lasting depression or other mental health condition
Other serious or chronic health condition
1) Yes
2) No

Do you now have a serious or chronic health condition or disease?
1) Yes
2) No

Family serious disease

Does anyone else now living in your household have a serious or chronic health condition or disease, such as any one of the following?
High blood pressure or high cholesterol

A heart condition or heart disease
A stroke
Emphysema or other chronic respiratory condition
Cancer or malignancy of any kind
Diabetes or high sugar levels
A liver or kidney condition
Serious chronic neck, back, or joint pain
Parkinson's disease or other neurological disorder
Lasting depression or other mental health condition
Other serious or chronic health condition

1) Yes
2) No

Appendix D. Descriptive statistics

Table A1 reports descriptive statistics for our key variables and covariates. All variables are scaled to 0-1, except for pro and con arguments. As mentioned in the main text, pro and con arguments have skewed distribution. Table A2 shows frequencies and Figure A1 plots distributions. Majority of respondents named less than three pro arguments, and few named more than seven. Very similar patterns were found for con arguments. The distributions of pros and cons look nearly identical.

Table A1. Descriptive statistics for key variables and covariates

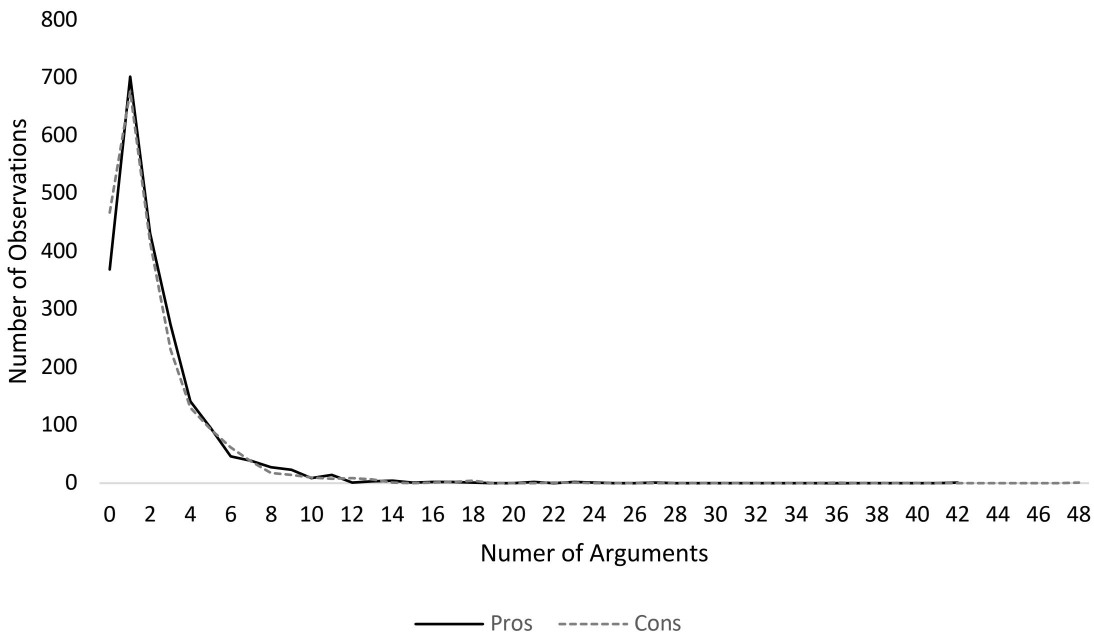
Variables (range)	Mean	SD	N
Support for Universal Healthcare (0-1)	0.59	0.33	2187
Pro arguments (0-42)	2.30	2.69	2193
Con arguments (0-48)	2.17	2.74	2193
Political Information (0-1)	0.59	0.21	2193
Party ID (0-1, 0=strong Rep, 1=strong Dem)	0.50	0.32	2170
Age (0-1, 0 = 18, 1=94)	0.35	0.20	2193
Years of Education (0-1)	0.47	0.20	2193
Gender (1=male)	0.47	0.50	2193
Income (0.02-1, percentile)	0.56	0.29	2193
Black (1=Black)	0.08	0.28	2182
Marital status (1=married)	0.64	0.48	2193
Political Interest (0-1)	0.79	0.23	2193
Political participation (0-1)	0.17	0.20	2192
Political discussion (0-1)	0.28	0.25	2188
Attention to political news (0-1)	0.62	0.22	2173
Attention to news about healthcare issues (0-1)	0.57	0.24	2186
Access to health insurance (1=insured)	0.87	0.34	2187
Own serious disease (1=yes)	0.36	0.48	2190
Family serious disease (1=yes)	0.42	0.49	2178
Healthcare satisfaction (0-1)	0.52	0.23	2164

Table A2. Frequencies of Pro and Con Arguments

	Pro	Con	Total
0	16.8%	21.3%	12.9%
1	32.0%	30.9%	6.8%
2	19.7%	19.0%	18.3%
3-4	18.9%	16.5%	26.3%
5-6	6.4%	7.1%	15.0%
7 or more	6.1%	5.3%	16.5%

N = 2,193

Figure A1: Distributions of Pro and Con Arguments



Note: The maximum of pro arguments is 42. The maximum of con arguments is 48.

Appendix E: Additional Information on Results in the Main Text

This Appendix supplements the results reported in the main text by providing additional information that was omitted in the main text.

Table A5 supplements Figure 2 in the main text. In addition to what was shown in the figure, it describes specific group means, standard errors, and number of observations in each group.

Table A6 reports the estimates of Equation 4 in the main text. The quantities in Table 2 in the main text are derived from this model.

Table A7 reports the estimates of Equation 5 in the main text. The quantities in Table 3 in the main text are derived from this model.

Tables A8 to A12 supplement Figure 3 in the main text.

Table A8 reports the the estimates of Equation 6 in the Main Text, which were used to impute "fully informed" opinions. Four models are specified. All models allow the effect of information to vary by party ID. Models 3 and 4 allow the effect of information to vary by other demographic factors (e.g., access to health insurance), which may affect evaluative criteria. Models (1) and (3) use the original political knowledge index. Models 2 and 4 use the percentile values.

Table A9 reports the the estimates of Equation 7 in the Main Text, which were used to impute "fully considered" opinions. A total of 16 models are specified. All models allow the consideration of pros and cons to vary by party ID. In addition, Models 9 to 16 allow the effect of information to vary by other demographic factors (e.g., access to health insurance), which may affect evaluative criteria. Also, Models 5 to 8, and 13 to 16 allow the effect of one side of argument to be heterogeneous by the awareness of the other side. In Models 1, 5, 9, 13, the number of pro (or con) arguments larger than three was recoded to three so that the maximum can be three, which was then divided by three. In Models 2, 6, 10, 14 values greater than five were recoded (to five). In Models 3, 7, 11, 15 the collapsing cutoff was 7. In Models 4, 8, 12, 16, percentile values of pros and cons were used without collapsing.

Table A10 reports four estimates of information effects, imputed in accordance with the 4 models on in Table 8. Among these, the estimates from Models 1 and 3 were shown in Figure 3, but the results are similar other specifications.

Table A11 reports 16 estimates of consideration effects, imputed in accordance with the 16 models on in Table 9. Among these, the estimates from Models 2 and 10 were shown in Figure 3, but the results are similar in other specifications.

Table 12 reports the estimates of Equation 8 in the Main Text, the experimental approach to estimating consideration effects based on deliberations. Six models are specified. Models 1 and 2 estimate the "intent-to-treat" effect by regressing opinion change on random assignment. Models 3 and 4 estimate the average treatment effect on the treated by using random assignment as instrument for attending deliberation meetings. Models 5 and 6 estimates average treatment effect by regressing opinion change on deliberation attendance. The identifying assumption for Models 5 and 6 are that the potential overtime change in the outcome variable for attendees and absentees would have been without the treatment. We report the results with and without control variables for each approach. Models 1, 3 and 5 do not make covariate adjustments. Models 2,4 and 6 do. The results are robust.

Table A5: Pros and Cons by Political Information and Party Identification

Pol Info	Total Pro	Con	N	Strong Rep Pro	Con	N	Moderate Rep Pro	Con	N	Independent Pro	Con	N	Moderate Dem Pro	Con	N	Strong Dem Pro	Con	N
Low	1.51	1.07	586	1.72	1.53	39	1.51	1.43	81	1.44	0.94	165	1.65	1.06	130	1.74	0.88	78
	(0.82)	(0.06)		(0.35)	(0.36)		(0.22)	(0.23)		(0.13)	(0.08)		(0.17)	(0.12)		(0.28)	(0.14)	
Lower	2.24	1.85	576	2.11	2.49	89	1.92	1.59	104	2.35	1.84	140	2.50	1.88	98	2.21	1.67	95
	(0.09)	(0.09)		(0.20)	(0.33)		(0.19)	(0.15)		(0.21)	(0.16)		(0.24)	(0.18)		(0.20)	(0.19)	
Higher	2.65	2.74	613	1.98	3.26	112	2.42	2.65	100	2.79	2.65	165	2.73	2.31	85	3.13	2.61	115
	(0.13)	(0.14)		(0.21)	(0.41)		(0.23)	(0.25)		(0.31)	(0.20)		(0.42)	(0.22)		(0.29)	(0.27)	
High	2.95	3.29	418	1.86	3.74	110	2.63	3.52	73	2.84	2.54	109	3.49	3.16	43	4.75	3.36	69
	(0.14)	(0.15)		(0.13)	(0.36)		(0.35)	(0.34)		(0.22)	(0.21)		(0.47)	(0.35)		(0.53)	(0.35)	

Entries are average number of pro and con arguments listed by each partisan group across different levels of political information, with standard errors in parentheses. Figure 2 in the main text is generated based on these estimates.

Table A6. Partisan bias in consideration of pro versus con arguments (Equation 4)

	Coef.	SE	*p*
Pro	-1.08	0.15	0.00
Moderate Republican	-0.78	0.20	0.00
Independent	-1.11	0.17	0.00
Moderate Democrat	-1.19	0.20	0.00
Strong Democrat	-0.90	0.20	0.00
Pro × Moderate Republican	0.95	0.22	0.00
Pro × Independent	1.41	0.19	0.00
Pro × Moderate Democrat	1.61	0.22	0.00
Pro × Strong Democrat	1.84	0.22	0.00
Constant	3.03	0.14	0.00

N = 4340 responses (i.e., 2,170 individuals). This regression model tests Equation 4 in the main text. Estimates reported in Table 2 in the main text are derived from this model. “Pro” is a within-individual factor indicating whether the response is the number of pros (or cons). Dummies for PID were created and used, with the base category representing Strong Republicans. Entries are maximum likelihood estimates. Individual-specific random effects are accounted for.

Table A7. Political information and partisan bias in consideration of pro versus con arguments (Equation 5)

	Coef.	SE	*p*
Information	4.23	0.78	0.00
Pro	1.77	0.61	0.00
Info × Pro	-4.15	0.85	0.00
Moderate Republican	-0.31	0.71	0.66
Independent	-0.10	0.61	0.87
Moderate Democrat	-0.16	0.67	0.81
Strong Democrat	-0.82	0.71	0.25
Info × Moderate Republican	-0.22	1.04	0.83
Info × Independent	-0.84	0.88	0.34
Info × Moderate Democrat	-0.74	1.02	0.47
Info × Strong Democrat	0.35	1.03	0.74
Pro × Moderate Republican	-0.77	0.78	0.32
Pro × Independent	-1.19	0.67	0.07
Pro × Moderate Democrat	-1.03	0.73	0.16
Pro × Strong Democrat	-1.61	0.77	0.04
Info × Pro × Moderate Republican	2.28	1.14	0.05
Info × Pro × Independent	3.71	0.97	0.00
Info × Pro × Moderate Democrat	3.74	1.12	0.00
Info × Pro × Strong Democrat	5.14	1.13	0.00
Constant	0.12	0.55	0.82

N = 4340 responses (i.e., 2,170 respondents). This regression model tests Equation 5 in the main text. Estimates reported in Table 3 in the main text are derived from this model. "Pro" is a within-individual factor indicating whether the response is the number of pros (or cons). Dummies for PID were created and used, with the base category representing Strong Republicans. Entries are maximum likelihood estimates. Individual-specific random effects are accounted for.

Table A8: Regression models for imputation of informed opinions

	Model (1)		Model (2)		Model (3)		Model (4)	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Intercept	0.84	0.04	0.68	0.03	0.70	0.09	0.64	0.06
Political Information	-0.68	0.06	-0.50	0.04	-0.21	0.14	-0.15	0.11
PID	-0.24	0.07	-0.01	0.05	-0.19	0.07	0.02	0.05
Information×PID	0.97	0.10	0.69	0.07	0.84	0.11	0.60	0.08
Age					0.14	0.11	0.10	0.08
Education					0.00	0.11	0.01	0.08
Male					0.02	0.04	0.01	0.03
Income					0.07	0.07	0.06	0.05
Black					-0.08	0.07	-0.06	0.04
Married					-0.06	0.04	-0.06	0.03
Insured					0.02	0.06	0.00	0.04
Satisfied					-0.02	0.08	-0.09	0.06
Own Health					0.14	0.04	0.11	0.03
Family Health					-0.03	0.04	-0.01	0.03
Information×Age					-0.20	0.17	0.60	0.08
Information×Education					0.05	0.17	-0.14	0.12
Information×Male					-0.04	0.06	0.05	0.12
Information×Income					-0.09	0.12	-0.03	0.05
Information×Black					0.14	0.12	-0.08	0.09
Information×Married					0.05	0.07	0.13	0.09
Information×Insured					-0.11	0.10	0.05	0.05
Information×Satisfied					-0.32	0.13	-0.09	0.08
Information×Own Health					-0.18	0.07	-0.24	0.10
Information×Family Health					0.09	0.06	-0.13	0.05
Information measure	Original		Percentile		Original		Percentile	
N	2165		2165		2109		2109	

Note. All variables were scaled to 0-1. All variables are scaled to 0-1. In Models 1 and 3, the original political information score (% correct) was used. In Models 2 and 4, percentile values of political information was used.

Table A9: Regression models for imputation of considered opinions

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)		Model (7)		Model (8)	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Intercept	0.51	0.02	0.48	0.02	0.47	0.02	0.54	0.03	0.52	0.02	0.49	0.02	0.47	0.02	0.55	0.03
Pro	0.29	0.04	0.40	0.04	0.50	0.05	0.46	0.05	0.27	0.05	0.38	0.05	0.48	0.06	0.44	0.06
Con	-0.45	0.03	-0.54	0.04	-0.61	0.04	-0.66	0.05	-0.47	0.04	-0.55	0.04	-0.62	0.05	-0.67	0.06
PID	0.11	0.04	0.18	0.03	0.22	0.03	0.07	0.04	0.11	0.04	0.18	0.03	0.22	0.03	0.07	0.04
Pro×PID	-0.01	0.06	-0.09	0.07	-0.13	0.08	-0.08	0.08	0.00	0.06	-0.08	0.07	-0.12	0.08	-0.08	0.08
Con×PID	0.43	0.06	0.45	0.07	0.47	0.08	0.59	0.08	0.42	0.06	0.44	0.07	0.46	0.08	0.58	0.08
Pro×Con									0.03	0.05	0.04	0.06	0.04	0.07	0.03	0.08

	Model (9)		Model (10)		Model (11)		Model (12)		Model (13)		Model (14)		Model (15)		Model (16)	
	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE
(Intercept)	0.54	0.05	0.56	0.05	0.55	0.04	0.53	0.06	0.54	0.05	0.56	0.05	0.55	0.04	0.54	0.06
Pro	0.36	0.09	0.43	0.10	0.49	0.12	0.47	0.12	0.34	0.09	0.41	0.10	0.48	0.12	0.44	0.12
Con	-0.26	0.09	-0.31	0.10	-0.31	0.12	-0.32	0.12	-0.29	0.09	-0.33	0.10	-0.33	0.12	-0.36	0.12
PID	0.11	0.07	0.04	0.06	0.02	0.05	0.08	0.05	0.12	0.07	0.05	0.06	0.03	0.05	0.08	0.05
Age	-0.02	0.07	-0.01	0.06	0.00	0.05	0.11	0.08	-0.01	0.07	0.00	0.06	0.00	0.05	0.12	0.08
Education	0.03	0.02	0.01	0.02	-0.01	0.02	0.00	0.07	0.03	0.02	0.01	0.02	-0.01	0.02	0.02	0.08
Male	0.02	0.05	0.02	0.04	0.02	0.04	0.03	0.03	0.02	0.05	0.02	0.04	0.02	0.04	0.03	0.03
Income	-0.03	0.04	-0.03	0.04	-0.04	0.04	0.03	0.05	-0.04	0.04	-0.04	0.04	-0.04	0.04	0.03	0.05
Black	-0.03	0.03	-0.02	0.02	-0.03	0.02	-0.05	0.05	-0.03	0.03	-0.02	0.02	-0.03	0.02	-0.06	0.05
Married	-0.02	0.04	-0.02	0.03	-0.02	0.03	-0.03	0.03	-0.02	0.04	-0.02	0.03	-0.02	0.03	-0.03	0.03
Insured	-0.11	0.05	-0.15	0.05	-0.17	0.04	-0.01	0.04	-0.11	0.05	-0.15	0.05	-0.17	0.04	-0.01	0.04
Satisfied	0.04	0.03	0.04	0.02	0.04	0.02	-0.09	0.06	0.04	0.03	0.05	0.02	0.04	0.02	-0.09	0.06
Own Health	-0.01	0.03	-0.01	0.02	0.00	0.02	0.05	0.03	-0.01	0.03	-0.01	0.02	0.00	0.02	0.05	0.03
Family Health	0.12	0.04	0.18	0.03	0.22	0.03	-0.02	0.03	0.12	0.04	0.18	0.03	0.22	0.03	-0.02	0.03
Pro×PID	-0.01	0.07	-0.07	0.07	-0.10	0.08	-0.06	0.08	0.00	0.07	-0.06	0.07	-0.09	0.09	-0.05	0.08
Pro×Age	-0.19	0.11	-0.22	0.12	-0.28	0.14	-0.26	0.14	-0.21	0.11	-0.23	0.12	-0.28	0.14	-0.28	0.14
Pro×Education	-0.01	0.10	-0.09	0.11	-0.15	0.13	-0.03	0.13	-0.03	0.10	-0.12	0.12	-0.16	0.13	-0.06	0.13
Pro×Male	-0.03	0.04	-0.01	0.04	0.02	0.05	-0.02	0.05	-0.03	0.04	-0.01	0.04	0.02	0.05	-0.02	0.05
Pro×Income	0.01	0.07	0.02	0.08	-0.01	0.10	0.03	0.10	0.02	0.07	0.03	0.08	-0.01	0.10	0.03	0.10
Pro×Black	0.01	0.07	0.01	0.08	0.02	0.09	-0.01	0.09	0.01	0.07	0.02	0.08	0.03	0.09	0.00	0.09
Pro×Married	0.01	0.04	0.01	0.05	0.02	0.06	0.02	0.06	0.01	0.04	0.01	0.05	0.02	0.06	0.02	0.06
Pro×Insured	-0.02	0.06	0.03	0.07	0.11	0.07	0.00	0.08	-0.02	0.06	0.03	0.07	0.11	0.07	0.00	0.08
Pro×Satisfied	0.08	0.09	0.14	0.10	0.17	0.11	0.18	0.11	0.07	0.09	0.13	0.10	0.16	0.11	0.17	0.11
Pro×Own Health	-0.01	0.04	0.00	0.05	-0.02	0.06	0.00	0.06	-0.01	0.04	0.00	0.05	-0.02	0.06	0.00	0.06
Pro×Family Health	-0.06	0.04	-0.07	0.05	-0.07	0.05	-0.08	0.05	-0.06	0.04	-0.08	0.05	-0.07	0.05	-0.08	0.05
Con×PID	0.37	0.06	0.37	0.07	0.36	0.08	0.49	0.08	0.36	0.06	0.36	0.07	0.35	0.08	0.47	0.08
Con×Age	-0.03	0.10	0.05	0.12	0.13	0.14	0.01	0.14	-0.03	0.10	0.05	0.12	0.13	0.14	0.00	0.14
Con×Education	0.03	0.10	0.09	0.11	0.12	0.13	0.02	0.13	0.02	0.10	0.09	0.11	0.11	0.13	0.00	0.13
Con×Male	-0.04	0.04	-0.02	0.04	-0.02	0.05	-0.05	0.05	-0.03	0.04	-0.02	0.04	-0.02	0.05	-0.05	0.05
Con×Income	-0.08	0.07	-0.09	0.08	-0.08	0.10	-0.10	0.10	-0.08	0.07	-0.09	0.08	-0.08	0.10	-0.10	0.10
Con×Black	0.07	0.08	0.08	0.10	0.11	0.12	0.12	0.10	0.08	0.08	0.08	0.10	0.11	0.12	0.13	0.10
Con×Married	0.01	0.04	-0.02	0.05	-0.03	0.06	-0.02	0.06	0.01	0.04	-0.02	0.05	-0.02	0.06	-0.01	0.06
Con×Insured	0.01	0.06	-0.07	0.07	-0.17	0.08	-0.03	0.08	0.01	0.06	-0.06	0.07	-0.17	0.08	-0.03	0.08
Con×Satisfied	-0.28	0.09	-0.27	0.10	-0.27	0.11	-0.40	0.11	-0.28	0.09	-0.27	0.10	-0.27	0.11	-0.40	0.11
Con×Own Health	-0.02	0.04	-0.06	0.05	-0.08	0.06	-0.05	0.06	-0.03	0.04	-0.06	0.05	-0.08	0.06	-0.05	0.06
Con×Family Health	0.11	0.04	0.15	0.05	0.15	0.05	0.16	0.05	0.11	0.04	0.15	0.05	0.15	0.05	0.15	0.05
Pro×Con									0.07	0.05	0.07	0.06	0.06	0.08	0.10	0.08
Cutoffs for Pro/Con	3 or more		5 or more		7 or more		NA		3 or more		5 or more		7 or more		NA	
Consideration measure			# of Arguments				Percentile				# of Arguments				Percentile	

Note. $N = 2165$ for Models 1 through 6. $N = 2019$ for Models 7 through 12. All variables, including Pro and Con, are scaled to 0-1. In Models 1, 5, 9, 13, the number of pro (or con) arguments larger than three was recoded to three so that the maximum can be three, which was then divided by three. In Models 2, 6, 10, 14 values greater than five were recoded (to five). In Models 3, 7, 11, 15 the collapsing cutoff was 7. In Models 4, 8, 12, 16, percentile values of pros and cons were used without collapsing.

Table A10: Estimates of Information Effects

	Model (1)	Model (1)	**Model (3)**	Model (4)
Point Estimate	**-0.071**	-0.068	**-0.044**	-0.041
Standard Error	**0.011**	0.011	**0.013**	0.013
95% CI (Upper bound)	**-0.050**	-0.045	**-0.019**	-0.017
90% CI (Upper bound)	**-0.053**	-0.049	**-0.023**	-0.020
90% CI (Lower bound)	**-0.090**	-0.086	**-0.066**	-0.063
95% CI (Lower bound)	**-0.093**	-0.089	**-0.070**	-0.067
Moderators	PID		PID and demographics	
Information measure	Original	Percentile	Original	Percentile

Note. Entries are the estimates of (imputed) informed opinion minus (observed) baseline. Estimates in bold are reported in the main text. The confidence intervals and standard errors are calculated using bootstrapping. Each set of analyses—i.e., regression and imputation—are replicated on 2000 bootstrap samples drawn from the original sample with replacement. Thus, the standard error and confidence interval for fully informed preference are standard deviation, and 5^{th} and 95^{th} quintiles of its values from the 2000 samples. Models 1 and 3 are reported in Figure 3 in the main text.

Table A11: Estimates of Consideration Effects

	(1)	**(2)**	(3)	(4)	(5)	(6)	(7)	(8)	Moderators
Point Estimate	0.015	**0.029**	0.038	0.031	0.020	0.040	0.053	0.038	PID
Standard Error	0.009	**0.014**	0.019	0.012	0.013	0.023	0.033	0.021	PID
95% CI (Upper bound)	0.032	**0.057**	0.076	0.053	0.044	0.085	0.117	0.081	PID
90% CI (Upper bound)	0.030	**0.053**	0.059	0.050	0.041	0.077	0.106	0.073	PID
90% CI (Lower bound)	0.0001	**0.006**	0.008	0.011	-0.001	0.004	-0.002	0.002	PID
95% CI (Lower bound)	-0.003	**0.001**	0.002	0.007	-0.005	-0.004	-0.012	-0.004	PID
	(9)	**(10)**	(11)	(12)	(13)	(14)	(15)	(16)	
Point Estimate	0.027	**0.049**	0.070	0.048	0.038	0.068	0.091	0.068	PID and Demographics
Standard Error	0.010	**0.015**	0.022	0.013	0.013	0.025	0.034	0.023	PID and Demographics
95% CI (Upper bound)	0.047	**0.079**	0.112	0.073	0.065	0.118	0.160	0.112	PID and Demographics
90% CI (Upper bound)	0.044	**0.074**	0.105	0.069	0.061	0.110	0.148	0.107	PID and Demographics
90% CI (Lower bound)	0.016	**0.025**	0.036	0.027	0.016	0.026	0.035	0.069	PID and Demographics
95% CI (Lower bound)	0.009	**0.020**	0.027	0.023	0.012	0.020	0.025	0.025	PID and Demographics
Pro×Con Term Included	No	No	No	No	Yes	Yes	Yes	Yes	
Cutoffs for collapsing	3	5	7	NA	3	5	7	NA	
Consideration measure		# of arguments		Percentile		# of arguments		Percentile	

Note. Entries are the estimates of (imputed) informed opinion minus (observed) baseline. Estimates in bold are reported in the main text. The confidence intervals and standard errors are calculated using bootstrapping. Each set of analyses—i.e., regression and imputation—are replicated on 2000 bootstrap samples drawn from the original sample with replacement. Thus, the standard error and confidence interval for fully informed preference are standard deviation, and 5th and 95th quintiles of its values from the 2000 samples. Estimates in bold are reported in Figure 3 of the main text.

Table A12: Deliberation Effect on Support for Universal Healthcare System

	Intend-to-treat effect Assign.				Average treat. effect on treated Assign. as IV for Attend.				Average treat. effect Attend.			
	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE
Deliberation	0.03^{+}	0.02	0.03^{+}	0.02	0.08^{+}	0.04	0.08^{+}	0.04	0.04^{+}	0.02	0.05^{*}	0.02
Covariates												
Pros			-0.01	0.00			-0.01	0.00			-0.01	0.00
Cons			0.01	0.00			0.01	0.00			0.01	0.00
Info			0.00	0.05			-0.02	0.05			-0.01	0.05
PID			-0.04	0.03			-0.04	0.03			-0.04	0.03
Age			0.01	0.04			0.01	0.04			0.01	0.04
Education			0.04	0.04			0.03	0.04			0.03	0.04
Male			0.02	0.02			0.03	0.02			0.02	0.02
Income			-0.01	0.03			-0.01	0.03			-0.01	0.03
Black			0.03	0.03			0.03	0.03			0.03	0.03
Married			0.00	0.02			0.00	0.02			0.00	0.02
Pol. interest			-0.02	0.04			-0.02	0.04			-0.02	0.04
Participation			-0.10	0.05			-0.10	0.05			-0.10	0.05
Pol. Discussion			0.07	0.04			0.08	0.04			0.08	0.04
pol. news			0.02	0.05			0.02	0.05			0.02	0.05
HC. news			-0.05	0.04			-0.05	0.04			-0.05	0.04
Insured			-0.01	0.03			-0.01	0.03			-0.01	0.03
Own disease			-0.01	0.02			-0.01	0.02			-0.01	0.02
Family disease			0.03	0.02			0.03	0.02			0.03	0.02
HC satisfaction			0.06	0.04			0.06	0.04			0.06	0.04
Intercept	-0.06	0.01	-0.06	0.05	-0.06	0.01	-0.04	0.05	-0.04	0.01	-0.04	0.05
N	1,325		1,266		1,325		1,266		1,325		1,266	
Estimator	OLS		OLS		2SLS		2SLS		OLS		OLS	

$^{+}$ $p < 0.1$ * $p < 0.05$. P-values are omitted for covariates.